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ABSTRACT

Skill requirements for the economy are changing. Whereas many jobs in industries such as insurance and banking once required high school graduates to do clerical work, computerization has changed the requirements. Job functions are combined, and many jobs now require college graduates to do analytical work. Although these skill changes require reforms in education such as those currently occurring, other more sweeping, as yet formless, reforms are needed in the educational system. The educational system defines skills and successes in terms of rather narrow academic criteria, whereas success in the real world can take a number of paths. Success in academic pursuits is not necessarily predictive of success in work, and failure in academic skill, beyond a certain basic universally needed level, does not necessarily presage work failure. Society needs and rewards many talents and attributes neither taught nor valued in academic institutions. Therefore, the next wave of educational reform needs to address the issue of how to help children make the best use of their individual talents. Children also should be taught real world-of-work values such as cooperation and team effort, as children in Japan are often taught. (KC)

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# SHADOWS IN THE WINGS: THE NEXT EDUCATIONAL REFORM

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Occasional Paper No. 1

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## PREFACE

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Good afternoon. It's a pleasure to be with you today. I have three objectives this afternoon:

- o to describe changes in skill requirements in the economy;
- o to show the relationship between these changes and the current wave of educational reforms with which you are familiar; and
- o to discuss a reform that I think is waiting in the wings, whose shape is not yet clear, but which I believe will approve key both for a group which will constitute an increasing share of the nation's labor supply -- at-risk children -- and for developing the full array of talents that the economy needs.

Let me be clear about what I will not talk about today. Many of you here work daily on issues such as how to improve America's trade balance -- the proposed Hawkins Education and Training for Competitive America Act or the Dodd Education for Competitive America Act, for example; how to help dislocated workers; what kind of training and education AFDC recipients should receive under workfare; how to help at-risk children -- such as the proposed Moynihan Educational Achievement Incentive Act or Pell School Dropout Demonstration Assistance Act; how to tackle the 1988-89 reauthorization of the Vocational Education Act or the reauthorization of the Education Improvement Consolidation Act (EICA).

My talk today does not discuss the specific implications of our ideas for the many legislative activities that engage you -- although it is relevant to at-risk children and vocational education. Partly this is because I believe that we have to think very differently about some of these issues. In fact, my most important point today may be the lack of exact fit between our ideas and current legislation. At the same time, I know that you are entertaining new policy perspectives, and you have a knowledge of current and proposed legislation much deeper than mine. I hope that my thoughts today will trigger questions that come out of this context. I will do my best to discuss them.

## I. Changes in Skill Requirements for the Economy

As federal policymakers, you already know the forces buffeting the American economy -- forces such as international competition, deregulation, and computerization. These forces are germane to education and business only as they affect the number, nature, and quality of the skills required in the economy.

There is tremendous confusion about changes in these skill requirements -- among both technical and non-technical audiences. There are several reasons for the confusion. One of two basic factors is that at least three major forces are affecting American industries -- international competition, transformation of the nation's technological base (in other words, computerization), and domestic de-regulation, a factor that has been relatively ignored. These forces play themselves out in different ways for different industries, with different effects on the nature and structure of

work across industries. (For example, not all industries are subject to all three forces.) Thus, studies of skill changes in certain industries may not generalize to other industries. A second reason for the confusion is that changes in skill requirements seem to have a life cycle. A great deal of scholarly ink has been spilled over an issue described by the ugly words, "upskilling" and "downskilling" -- in other words, over a fight about whether computerization increases or decreases the skill demands of jobs. The data increasingly suggest that often you have both effects, but in sequence -- first a downskilling, and then as computerization lets the worker increase his or her span of control, an upskilling.

Early results from a project in the Center that I direct, the National Center on Education and Employment, illustrate some of the profound changes that are occurring in industries. This project, directed by Doctors Thierry Noyelle and Thomas Bailey, is examining skill changes and employers' training responses in four industries, selected to represent the manufacturing and service sectors of the economy and different skill levels (low/middle and high). These industries are banking/insurance and what are called business services -- for example, accounting and management consulting firms; the textile/garment industry; and electronics manufacturing. We now have results for the banking and insurance industries, and the skill shifts look very similar.

The insurance industry has been subject to computerization and international competition for property and casualty coverage. Computerization has caused five distinct jobs to be folded into one. These five jobs were:

- messenger
- file clerk
- customer assistance clerk
- claims adjuster, and
- policy writer.

When the insurance industry ran on paper, it required file clerks to categorize the paper and messengers to move it among offices. Computerization virtually eliminated these jobs and combined the other three jobs. The customer assistance clerk had been essentially an order-taker: he or she answered the telephone recorded what the customer needed, and routed that request to either a claims adjuster or to the policy writing group. With the advent of computers, that person who now answers the telephone is expected to complete these routine and not-so-routine interactions during one call. He or she works with a computer terminal and software that gives him or her access to claims settlement files and to information about the nature of and rates for insurance coverage that the company offers. The computerization of policy writing rules and the printing speed of laser printers allow -- and therefore require -- the person to customize insurance contracts.

Today the person who performs this combined job is often called a claims adjuster. However, the skills required to perform this job are greater than those associated with any one of the original five jobs. The job occupant is less an order taker than an advisory analyst. He or she has to

have good communication skills and be able to help diagnose the customer's needs through an analytic series of questions and answers. The person needs less specific and splintered knowledge and more systematic and abstract knowledge -- the ability to understand multiple arrays of information, the rules governing them, and the relationships between arrays. He or she also needs to be able to frame answers to less standardized requests. Insurance companies used to hire high school dropouts or graduates for the five jobs. They now hire individuals with at least two years of college for the restructured claims adjuster job.

This case provides us with a warning about using occupational projections to infer future skill requirements. The name of a job can remain the same -- as has the job of claims adjuster -- but change dramatically in content and skill requirements.

The banking industry has been subjected to all three forces and in the last decade has completely changed its skill requirements and staffing patterns. Before computerization and de-regulation, top bank management consisted of college graduate generalists; the bank branches operated with a branch manager, assisted manager, head teller, tellers, and clerk/typists who did the routine paperwork for activities such as opening accounts. The tellers were usually high school graduates with traditional accounting skills, and promotions to low level management came out of the teller group.

Today the teller job is highly routinized, simply a human alternative to those who do not like to use automated banking services. The desk jobs, previously the clerk/typist jobs, are still the jobs that deal with customer's service needs. However, bank de-regulation has generated an explosion of services, and individuals in these jobs now must be able to analyze a much wider array of the customer's financial needs, understand the array of the bank's financial services, and, if possible, produce a match -- i.e., make a sale. Banks find that they can hire part-time and less educated help for the highly routinized teller jobs, but must hire college graduates for what used to be the clerk/typist jobs. Like the insurance industry, banks find that they need people who can analyze and deal systematically with an array of data. Promotions now come out of the desk jobs, not the teller jobs -- in fact, tellers are essentially isolated from promotion opportunities in the bank. At the same time, the skill requirements at the <u>top</u> of the bank have also changed. Banks now need, not college graduate generalists, but highly trained specialists -- financial analysts and computer systems analysts, for example.

The researchers on this project think that the insurance and banking cases will turn out to be the "metaphor" or "clue story" for industries based on paper. They are now determining how work based on metal -- i.e., manufacturing, is changing. Manufacturing and service work have always been treated as very different. However, both sectors are subject to similar forces, and our researchers suspect that manufacturing jobs may be restructuring in ways similar to service. Both may be moving to symbol-based work.

## II. What are the Implications of these Skill Changes for Current Education Reforms?

Those educational reforms targeted at improving students' academic skills -- verbal, mathematical/logical, conceptual, reasoning, problem-solving skills -- seem to fit the direction of skill change in the economy. In fact, up to a point, academic and work-related curricula should be the same. In a moment I will talk about the limits to this statement -- about the complications that surround it. However, from the perspective of the economy, the current reforms are right as far as they go.

## III. Limits to Current Reforms and Shadows of the Next Wave

At the same time, these reforms are but a first approximation. Another reform is waiting in the wings, its shape still quite unclear. I raise the issue of this next reform with you today, not because we can or should expect action on it yet, but because what I think is legitimately the focus of subsequent reform could compromise or derail current reforms. We are not yet ready to act on this subsequent reform, not only because implementing current ones will exhaust available energies, but also because the ideas needed to power this next reform are not yet mature.

I suggest that the next reform will be organized in some way around a much fuller definition of human talent than narrowly defined academic skills, and I think that it will be driven by a confluence of two facts. The first is that the economy needs, uses, and rewards an array of human talents much wider than narrow academic skills. The second is that employers will have to rely increasingly on workers from the ranks of at-risk children. Later I will describe in more detail what I mean by a wider definition of human talent, but at this juncture, let me just say that I am not referring, even obliquely, to vocational education. I am talking about basic talents that show up and should be developed early in life.

In making my case for the limits to the current reforms, let's start with my first assumption -- that the economy needs and rewards a much wider array of skills than narrowly defined verbal and mathematical/logical abilities. Common sense and fragmentary data seem consistent with this proposition. Let's look at some of the evidence.

- **First: The social sciences explain and predict individual educational achievement quite successfully.**

We do a fairly rotten job of predicting occupational attainment, whether measured as occupational status or wages. Educational achievement does not predict occupational attainment all that well. In statistical language, we are left with substantial unexplained variance, which says that skills other than those we measure and reward in school are important in determining labor market success.

- **Second: We see surprising variations in educational**

**attainment among those working even in high status, white collar jobs.**

For example, let us look at the education of those classified in the 1980 Census as working in management, specifically at that group in management that has the most years of education (the 25-34 year old cohort). We find that of those 25-34 year olds in management in 1980, 25 percent had no more than a high school degree; 25 percent, one to three years of college; 30 percent, a college degree; and 20 percent, at least a fifth year of college. What is more remarkable is that those with no more than a high school degree are not restricted to jobs such as managing a McDonald's or a Wendy's. For example, 30 percent of the 25-34 year old chief executives in 1980 had no more than a high school degree -- and, if we ignore age, 50 percent of the nation's chief executives in 1980 had no more than a high school degree.

These data imply that concentrated, cumulative academic learning, that relies so heavily on good verbal and quantitative skills, may be critical for the professions, but that talents beyond these are valued even in jobs that we usually define as very good jobs.

- **Third: Fragmentary data suggest that experienced workers, even highly skilled workers, move among disparate occupations without always having in their formal educational background the training germane to the move.**

These patterns challenge the implicit assumption in this country that occupations require occupationally-specific education -- i.e., that occupations are like countries with immigration barriers and that workers cannot enter a country without "special papers."

We can interpret these data in several ways. From the perspective of skill requirements, what seem like "disparate" occupations may in fact be much more similar than we had realized. Or these mobility patterns may reflect the effects of a good general education -- of learning how to learn and therefore of being able to accommodate the skill demands of multiple jobs. Or these patterns may signal that individuals have somehow developed talents needed in jobs, but not addressed in school curricula, and therefore not measured by our measures of the formal education undertaken prior to job moves.

Thus far I have talked about some labor market puzzles that can be solved by postulating that markets need an array of skills wider than traditional academic skills. Let me now turn to at-risk children because employers will have to rely increasingly on them in order to run the economy. By at-risk children I mean those who do not perform well in traditional schools, either because they are not very good at standard academic subjects or -- and this is an exceedingly important "or" -- because they do not want to be good at them. For whatever reason, these children, as they age, barely scrape by to graduation, or drop out of school. It is important to note that although at-risk children come disproportionately from poor families, almost everyone in this audience either has a child of this sort or friends with a child of this sort. No group escapes this problem.

My thinking this afternoon about at-risk youth has to do with the child's vision of his or her adult "place" in the world. I suggest that all children develop an image of their niche in the adult world -- in the ecological sense of niche. Their ideas about the ecology of adult "places" may be distorted and are usually pitifully partial. However, they seem to work out notions of their basic futures and of the trajectories relevant to them, even if they cannot state these explicitly. And they act on these ideas -- electing into or out of advanced mathematics, depending on their sense of occupational destination.

For example, I analyzed data from a national longitudinal survey of youth, concentrating on the 14 to 17 year olds in the sample. The purpose was to understand the dynamics that underlie the traditionality of young girls' occupational choices. But, as is often the case in research, the unanticipated findings were more interesting than those expected. What drove these girl's occupational choices were fundamental choices about what kinds of commitments they expected to make as adults. The adult agendas that these girls had for themselves revolved around the basic issue of family versus work. Their commitment to one or the other (or to some balance between them) drove the traditionality of their occupational choices, which in turn drove the future educational investments that they expected to make. We can note that these agendas were fully developed even for the 14 year olds, indicating that their concepts of their futures had to have been forming well before the age of 14.

I doubt that these girls knew that many of their future plans simply cascaded from and elaborated a fundamental choice of direction. In other words, I do not think that most of these girls could have cogently described the structure of choices that lay so clearly in the data. Nonetheless, I suggest that the basic behaviors of all children, at-risk and not-at-risk, can be interpreted from the perspective of what place they can envision for themselves. For example, I suggest that the girl who becomes a teenage mother, although we hear a great deal about her "wanting someone to love," is more fundamentally taking the action that lets her occupy the niche of "mother," a place in the adult firmament that best fits how she sees her talents and opportunities. (Never mind the destructive potential of that choice and we can see.) From this perspective a decision to keep the baby is essential to implementing her sense of place in the world -- and our attempts to contain the damage of teenage pregnancy by trying to persuade her to put the baby up for adoption attests more to our dimness than to hers.

Similarly, the child who drops out -- or behaves so intolerably that he or she is pushed out -- may not be able to envision and emotionally claim an adult future that requires the core curriculum of the high school. When schools concentrate on narrow verbal and mathematical-logical skills, though Lord knows that these are important, I suggest that we may unintentionally be limiting the child's vision of the adult world to academic activities, whereas in fact only a small share of total jobs are highly academic in skill content and requirements. To the extent that the children cannot envision participating in adult academic activities, two things happen. First, the child cannot look to the school for his or her sense of ultimate place and

trajectory -- he or she must look elsewhere, and the school, in a basic sense, has lost the child. And second, instruction in academic skills will become "irrelevant" to the child -- or, in decision theory terms, without "utility." Decision theory presumes and countless studies show that individuals -- children and adults, at-risk children and not-at-risk children -- do things that have utility for them -- that connect to what they want or where they expect to be going.

It is from this perspective that secondary vocational education, otherwise riddled with serious structural problems, may have its greatest value. In analyses that I conducted some years ago, I found a curious bundle of attitudes and outcomes for high school students in the vocational track. Relative to their peers in the non-vocational curricula, the vocational group: (1) did not do well at what schools tend to define as their highest status mission, cognitive development; (2) were not part of the high school's extracurricular structure except for that part directly related to the vocational curriculum; (3) rated the quality of the school positively; (4) were not alienated from the high school; (5) did not regard themselves as having been channeled into the vocational curriculum; (6) saw money, steady work, and a happy family as the goals of life; (7) preferred to work after high school; (8) selected practical -- in other words, technical and vocational -- post-secondary education; (9) had higher post-secondary employment rates and higher numbers of hours worked per week; and (10) were more satisfied with jobs--both in general and on particular dimensions, such as working conditions and opportunities for promotion and advancement.

In other words, the vocational group had an agenda that fit the mission of the vocational curriculum. As such, we can posit that it provided a niche for them during their high school years -- accounting for the fact that their attitudes toward school were relatively positive, despite their being poorly integrated into the academic and extracurricular life of the high school.

In sum, for all children, relevance may be the key, and the key to relevance for the at-risk child may be that broader array of talents that I talked about earlier. Some of you know of the work bubbling up among psychologists and educators at several institutions -- Harvard, Yale, and Teachers College, among others -- on talents other than verbal and mathematical-logical talents. For example, in Frames of Mind, Howard Gardner at Harvard adds to traditional academic talents spatial abilities (as found in architects and structural engineers); physical co-ordination (of dancers, athletes, dance and exercise therapists); musical gifts; interpersonal perceptiveness that makes the good salesperson, manager, diplomat, or psychotherapist; and the inner attunement that allows the individual to live out an inner calling, as in the spiritual leader.

Knowing psychologists, these lists of talents will inevitably balloon -- probably to numbers that will render them pedagogically useless and that will force us to disciplined taxonomic and measurement work. However, I think that the direction is correct and fundamentally agree with Gardner's statement in a November 9, 1986, New York Times article:

> "The single most important contribution that education can make to a child's development is to help him toward a field where his talents best suit him, where he will be satisfied and competent. We have completely lost sight of that. Instead we subject everyone to an education where, if you succeed, you will be best suited to be a college professor. . . . We should spend less time ranking children and more time helping them to identify their natural competencies and gifts and cultivate those. There are hundreds and hundreds of ways to succeed, and many, many different abilities that will help get you there." (Education Section, p.23)

In other words, school should mirror life. And competence and confidence in one domain can give the child courage to tackle weaknesses in others. The implications of this perspective for the structure of schools, for the K-12 curriculum, and for how we train, select, and assess teachers will be profound, but now are far from clear. What is clear is that we need to question "received wisdom" about what our schools teach and how they should teach it. The answers will be important, even if they only validate current policies and practices. For example, for a moment, let's play with ideas about how to restructure the vocational curriculum. A Rand Corporation colleague of mine, Dr. Jeannie Oakes, posits the following vision.

> . . . a reconstructed vocational curriculum could be organized around essential concepts drawn from the traditional academic disciplines. These concepts are appropriate because they represent the most solid knowledge that underlies all of the enterprises that we call work . . . . [A]s this curriculum develops. . .it [should become] increasingly difficult to tell if it is the academic or the vocational curriculum that is being reconstructed.
>
> Instruction should emphasize learning processes and values that are consistent with valued and sustaining life and work skills -- cooperation; team problem-finding and solving; communication; decision-making; commitment; confidence in abilities; and boldness in developing ideas and approaches. Learning activities should be presented as real-life problems: full of ambiguity; bound to specific circumstances and constraints; dependent on formal knowledge and creative "figuring-out"; and with important consequences. . . .
>
> Basic concepts would ground all learning activities, and these concepts would appear and reappear in increasingly sophisticated forms as children get older
>
> For example, the youngest children would learn concepts of production, distribution, and consumption by talking about manufacturing and growing products, and transporting and selling them to families. These concepts would be reinforced by visits to industries, farms, harbors, railroad stations, and stores. . . . Senior high schoolers would revisit these concepts through intensive classroom study of theory and historical development (in genetics and the development of hybrid crops, for example); with controlled in-school laboratory and shop experimentation in inventing, growing,

> constructing, programming; and focused field experiences, with students connected with supportive adults who are occupationally engaged in the processes they are studying. (Beyond Tinkering: Reconstructing Vocational Education, pp.6-7 and pp. 9-10)

Let's relax another assumption -- about how classrooms should be organized. For example, there are many adult situations where team performance -- and the individual's ability to perform well within a team -- matter far more than individual pyrotechnics. However, our schools are organized to develop and grade competence of the individual, not an individual's competence in the group. We can change how we organize the work of the classroom. For example, in the recently released the U.S. Department of Education report on Japanese education (Japanese Education Today), we see that for grades 1-6, the Japanese school organizes each classroom into small, mixed ability groups called "hans." These groups of four to six students are cooperative study and work units; they often report the results of an assignment as a team. These groups are also the primary units for discipline, chores, and other classroom activities. For example, Japanese teachers rarely reprimand individual children. They prefer to guide the class in such a way that students assume responsibility for correcting each other's behavior. Rather than calling an inattentive child by name and encouraging him to hurry, the teacher typically remarks that a particular han is not ready and allows the child's han-mates to exert peer pressure to encourage the child to take or complete the necessary action.

Japanese schools also use a system of student monitors to manage the classroom. Each day or two, a different pair of students is in charge of calling the class to order, assisting the teacher in administrative tasks, and encouraging classroom discipline. The monitor role is rotated frequently so that every student has the chance to serve in this capacity. This system not only shifts some of the disciplinary burden from the teacher to the students; it also gives each child a chance to learn supervisory and leadership skills (Japanese Education Today, Report OR 87-500, p.27).

In sum, I think we are right to concentrate now on getting our academic house in order--in other words, increasing our children's verbal and mathematical competence. However, if we can make progress on what are now just shadows in the wings, I think we will help not only our economy, but all of children, especially those at risk.

## IV. How the National Center on Education and Employment Can Help

The National Center on Education and Employment based at Teachers College, Columbia University, and in partnership with The RAND Corporation, is committed to research the issues that I have talked about today. I have already alluded to our projects on changes in the economy's skill requirements and for what these changes imply for the nation's schools.

In several related projects cognitive psychologists, anthropologists, sociologists, and economists are working to understand how human beings use formal and informal learning opportunities to build the myriad skills that we

see them exhibit in the workplace. One project is dedicated to conceptualizing and measuring work-related educational outcomes. What may seem like an esoteric methodological project is in fact key to policymakers who need to know the human capital effects of schools.

And The RAND Corporation will conduct community-based strategic planning with a state or metropolitan area, still to be selected. The purpose is to work with key actors in the community on work-related education, the issues to be addressed arising out of data collected and analyzed by project staff on the nature of the community's skills demand, characteristics of current and projected labor supply, and the nature of the state's institutional resources for developing human capital. Only through projects of this sort can we come to appreciate what you as employers face "on the ground" -- or on the firing line.

The National Center is in this game for the long haul, as, so clearly, are you. I hope that we can be of service to you in the months and years to come. Please let me know if we can. Thank you.